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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/829,876

04/10/2001

Shuichi Kikuchi

10417-076001

7681

26211

7590

11/17/2004

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EXAMINER

OWENS, DOUGLAS W

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/829,876

**Applicant(s)**

KIKUCHI ET AL.

**Examiner**

Douglas W Owens

**Art Unit**

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-28 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5 and 21 is/are rejected.
- 7) ☒ Claim(s) 7-20 and 22-28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 10, 2004 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 5 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent No. 5,578,514 to Kwon et al.

Regarding claim 5, Kwon et al. teaches a method of making a semiconductor device comprising the steps of:

implanting an impurity of a first type (23) in a semiconductor substrate (12) of a second type in a single implantation step;

providing a first gate insulation film (26) by applying heat treatment in a single step;

diffusing the implanted impurity (Col. 2, line 65 – Col. 3, line 9);

providing a second gate insulation film (30) on the substrate in a different location than the first gate insulation film;

providing a gate electrode (32) that spans from the first gate insulation film to the second gate insulation film;

providing a source region (34) of the first conductivity type; and

providing a third drain region (36) of the first conductivity type.

Kwon et al. does not explicitly teach that the impurity region (23) is diffused such that a first drain region is formed, wherein the first drain region has a lower impurity concentration than the second drain, and further, where the second drain region is above the first drain region. Kwon et al. teaches performing a thermal step for the purpose of diffusion drive in after the implantation step. Kwon et al. discloses that the diffusion drive in step is performed at approximately 1100° C for approximately 120 – 240 minutes (Col. 3, lines 6 – 10). The Applicant discloses that diffusing a first implant forms the first and second drain regions. The method taught by Kwon et al. would have inherently resulted in a device having first and second drain regions as claimed in the instant application since the steps performed subsequent to the implant are nearly identical.

Regarding claim 21, Kwon et al. teaches a method of manufacturing a device, wherein the source region is in direct contact with the substrate.

***Allowable Subject Matter***

4. Claims 7 – 20 and 22 – 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

5. Applicant's arguments filed November 4, 2004 have been fully considered but they are not persuasive.

Applicant argues that there is no teaching in Kwon et al. of a first and second drain region, asserting that "All that is disclosed by the Kwon et al. patent is that a dopant region 23 (see FIG. 1) is driven in to produce the N-type drift region 24...". Examiner agrees that Kwon et al. teaches a single implant (23), which is then driven in using a thermal process. The first and second drain regions of the instant application are produced by performing a single implant (3) and then performing a thermal process to drive in the implant. It is not reasonable to expect two different structures to be fabricated, because the two processes are the same. Additionally, it is known that the process performed by Kwon et al. would have resulted in the same doping profile as that of the instant application. This is further evidenced by Campbell in figures 3-8 to 3-10 of pages 49 and 50, where Campbell shows the typical doping profiles of several ions in silicon. Applicant has not shown how the same process used by Kwon et al. results in a different structure in the instant application.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

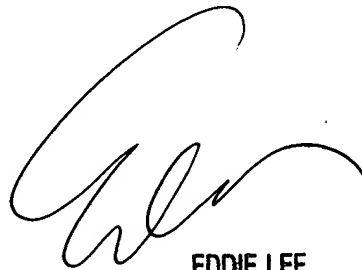
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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DWO

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name and title.

**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**